1 May 1957

MEMORANDUM FOR: Chairman, GMIC

FROM : GMIC Intelligence Adviser at REG

SUBJECT : Data on [redacted] Sources (Letter #4)
25X1C

This represents the last letter of a series of four. The main purpose has been to keep you cognizant of source interrogation progress, future interrogation plans, and to provide information considered worthy of advance notification.

TOPIC A — Source Exploitation and Forthcoming Reports

REG-359

1. Items A (Details of Technical Conferences), B (Glossary of Soviet Technical Terms), and C (Soviet Personality Biographic Data) of the phase IV exploitation have been covered. Item B was produced on April 22 as EG-1780. Information obtained on items A and C has been recorded on tape and translation of the material is underway. These items will be published in reports EG-1789 and EG 1791 respectively.

2. Source is presently on a four (4) week leave which will terminate in mid-May 1957. On return the interrogation will continue on other items of Phase IV. All items included in this phase were outlined in attachment A of GMIC letter #3.

REG-360

The interrogation of Source on details of the ShM has been completed. The report will be published in early May as EG-1787.

A report on details of the "V and VS Missile Controls" was published as EG-1778 on 29 March 1957.

A report covering biographical data on German personalities at Kuybyshev, Moscow and Sukhumi was published on 19 April 1957 as EG-1779.

On sources completion of the ShM, a portion of his time will be devoted to completing biographical data on Soviet personalities. This will be published later as EG-1785.

Source will be probed on April 25 and 26 on production and economic knowledgeability with the assistance of [redacted] (ORR).
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REG-361

1. The PIR will be published April 29th as EG-1777. The report EG-1784 originally titled "Soviet Organization, Personalities, and Institute Lay-out at 228 L.C." has been divided into two separate reports. The report EG-1784 titled "Soviet Organization and Personalities" will be published by mid-May. The report EG-1792 titled "Soviet Institute Lay-out and Area Description" will be published by mid-May.

2. Source will be probed for production and economic information on April 29, 1957, by [redacted] (ORR). 25X1A

3. The interrogation of source will terminate in early May 1957; however, he can be made available for future requirements.

REG-364

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1. The early exploitation has been focused on acquiring information on priority intelligence requirements in direct support of the [redacted] conference. Information has been reported in AMA cables REG-91GM, REG-93GM, and REG-94GM. Topic B which follows covers various information acquired from the new source.

2. The PIR is now being written and will be published as EG-1794.

3. Source has been on leave since April 12 and returned for interrogation on April 24.

TOPIC B -- Information of Interest

The following is considered of particular interest. Future published EG reports will cover these items in additional depth:

SOURCE: REG-359

1. Source reports that the range requirement for the command system was no greater than thirty (30) Kms, and, possibly, could have been as low as twenty-five (25) Kms. He reviewed his simulated laboratory tests of the transmitter missile receiver system at the institute, pointing out the difficulties in ascertaining system performance. He remembered that the Soviets took a completed system off from the institute for dynamic tests sometime in late 1952 or early 1953. He was anxious at the time as to whether the system would meet the design specifications. On the groups return, they related that the system functioned well to thirty-five (35) Kms.

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2. Source was interrogated in relation to the receivers (heads) reported by STIB source [redacted]. He maintains that he never worked on or observed such a device, and cannot remember [redacted] presence at the time (August 1952) in question. A hand sketch of the receiver frame was shown source for refreshing his memory, without results. 25X1C

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SOURCE: [redacted]

1. The recent interrogation by U.S. representatives failed to reveal additional information on the reported receivers (heads). It was found that the location within the laboratory where source observed heads is precisely where [redacted] and members of the [redacted] were located at the reported time of observation. Source will not deviate from his story and maintains that if he is brought together with [redacted] the problem can be resolved. The three sources may be brought together later for possible clarification of this discrepancy.

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2. The information reported in GMIC letter #3, dated April 5, 1957, under Topic B, paragraph b was originally reported by STIB as coming from [redacted] It was found that the source was, actually, [redacted] Since [redacted] was absent (ill), it was not possible to pursue this.

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SOURCE: REG-364

KOMET

A. General

(1) Source reports that KOMET was an air to surface beam riding missile development which was based on a thesis of Major BERIYA. The development was divided into two sections, KOMET I and KOMET II. One was the missile equipment, and the other the aircraft equipment, however source is not certain which. His work was concerned with the aircraft equipments which included a three (3) CM transmitter (100 KW peak power), scope indicators, impulse generators, range tracking component, receiver and associated power supplies.

(2) As the development progressed (1948-49), more and more Soviet engineers and technicians were brought into the project, all of whom were under Major PANFILOV. Source's work came to an end in December 1949, when he was replaced by ROMANOV.

(3) Source believes that Soviet KOMET activities continued since Soviet engineers who had visited the institute occasionally while the laboratory models were being built (1949) were practically permanently at the institute soon after. Among these was the Soviet WEITZMANN who was concerned with the antennas.

B. Flight Tests

Sometime after 1951, source heard from a Soviet that the KOMET system had been tested "in a desert area north of the Sea of Azov." The first tests utilized a man in the missile portion, and were reported successful. Date of test is unknown to him.

C. Komet Award

Sometime about mid-1951, [redacted] engineers who had worked on the KOMET equipment were called into KUKSENKO's office, and awarded premiums for their part in the project. At this time [redacted] were awarded Stalin Prizes for their contribution.

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D. Soviet Terminology for Komet

Russian terminology was Steuerende (Steering) and Gestenerte (Steered) for the aircraft and missile equipments respectively.

SOVIET PERSONALITIES

SAKSON — An antenna specialist who visited the institute and gave a lecture. Had civilian status. Believed to have come from an antenna institute.

BUNKIN — Known to have association with RASPLETIN and concerned with the Soviet AZH system.

LIFSHUTZ (phonetic) — Professor, and leading member of Soviet development group on electronic computer for B-200.

FEDOROFF — Said to have received letter in Fall 1952 at institute from RASPLETIN who was at desert range. RASPLETIN requested that BEIER should start work on pre-flight check out equipment.

YELAN — Non technical director of the institute. Attended discussions in Hall at 228 L.S. just prior to movement of equipment to KRATOVO in mid-1952.

ACTIVITIES OF THE MONINO, KUYBYSHEV AND OSTASHKOV GROUPS DURING THE PERIOD OCTOBER 1950 - FEBRUARY 1951:

Source learned that these groups began work on the ZH on arrival to the institute in October 1950. [redacted] had completed 80% of his study of the radio command section and [redacted] (KUYBYSHEV) had completed his study of the rudder section by February 1951. [redacted] had completed 60-70% of his study of the angle and range tracking system by this time. [redacted] performed in an administrative capacity.

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B-200 COORDINATE CABINET NOMENCLATURES

The tracking panels of the cabinet were designated as follows:

Block I. Target range tracking unit.

Block II. Missile range tracking unit.

Block III. Target azimuth tracking unit.

Block IV. Missile azimuth tracking unit.

Block V. Target elevation tracking unit.

Block VI. Missile elevation tracking unit.

RADAR

1. Indicators

Two indicators one presenting Azimuth-Range, and the other Elv-Range are utilized. The ordinate is range, and the abscissae angle. The azimuth scale was calibrated in degrees (+27 degrees -0 degrees -27 degrees), and elevation marked from eight (8) degrees through sixty-two (62) degrees. The ordinate (range) is calibrated in five kilometer steps through 50 Kms. The cathode ray tubes were approximately nine (9) inch in diameter with an aluminum reflecting screen, of medium decay time, and high resolving power. The Soviets also had J-scopes at KRATOVO (1952) which they were experimenting with. (See also EG-1775 — REG-359.)

2. Angle Reference Pulses

a. AZIMUTH

The azimuth angle was measured about a zero reference point that was on a line bisecting the fifty-four degree coverage angle. All azimuth angle was measured right (+27 degrees and left -27 degrees from a reference pulse at zero degrees.

b. ELEVATION

The elevation angle was measured from a zero reference point of eight (8) degrees elevation up through sixty-two (62) degrees.

3. Radar Antenna

a. Source estimates that the diameter of a circle which circumscribes antenna piece would be approximately six (6) to seven (7) meters. The thickness of the antenna was (25-35) cm.

b. Mounting angle of azimuth antenna estimated at 38-40 degrees.

c. Antenna beam width in its narrow plane; 1.5 degree at $\frac{1}{2}$ power point.

d. Antenna beam width in its wide plane; greater than sixty (60) degrees at $\frac{1}{2}$ power point.

4. Traveling Wave Tube

The tube utilized at RAMENSKOYE AIRFIELD was believed to have gain of (25-30) db. No data on noise figure, or quantity of tubes present obtained to date. Source reports that its use improved the system sensitivity. There were no spare TW tubes available at the RAMENSKOYE tests.

5. Radar Transmission Pulse Width

0.8 microsecond ±0.1 microsecond (REG-359 reports 0.4 microsecond).

6. Radar Receiver I.F. Frequencies

Target Tracking. 45 mc/s
1st (5 channel) System. 25 mc/s
2nd (5 channel) System. 35 mc/s
3rd (5 channel) System. 50 mc/s
4th (5 channel) System. 60 mc/s

B-200 RADIO COMMAND SYSTEM DATA

Source knows only that system operated in the decimeter wavelength band. One radio command system is utilized with each five (5) channels. Thus four (4) radio command systems are utilized with a twenty (20) channel B-200 system. The ground antenna utilized consisted of a dipole and reflector. Source reports that the antenna beam pattern was broad enough to cover the azimuth (54 degrees) and elevation (8-64 degrees) sector.

LABORATORY MISSILE FLIGHT SIMULATION

1. Based on sources visual observation, about mid-1952 the simulation laboratory under the leadership of [redacted] was as follows: Three channels of the BZH system were present. This included the coordinates cabinets, Az and ELV indicators, associated computers, one radio command-receiver link, and a target-missile signal simulator termed a "phantom." 25X1C

2. A programing device was present which permitted putting in various intercept problems all unknown to him. The target and missile were strobed (tracked), and coordinate information supplied to the computer. The computer output was applied to the ground radio command system. Actual transmission occurred and was received by the missile command receiver. The actual missile control system was utilized since source remembers the hiss of air. This portion was shielded from view by large white screens. The position of the control rudders was obtained by mechanically linked potentiometers.

3. Source believes that tests were conducted with target speeds of 300 meters/sec. Under the condition of straight in flight, optimum missile intercept range was thirty-five (35) to (40) kilometers.

4. Source remembers that an indicator light went on when successful intercept had been obtained. This stood out in his memory since all were happy when this occurred.

5. The simulation laboratory became accessible to the source about mid-1952. Other [redacted] who had accessibility were [redacted]. Source reports that the Soviets were satisfied with the equipment since it saved a lot of flight time.

POSSIBLE B-200 ACTIVITY PRIOR TO OCTOBER 1950

Source reports that [redacted] (REG-358) was given the task of designing an impulse central having a PRF of 2500 cps. The starting date was January 1950. When source visited the Soviet (A) system at KHIMKI in May 1951, he recognized some of the features of the [redacted] impulse central.

RANGE TESTING

1. Sometime between mid-November 1952 to January 1953 Soviets returned from range tests and stated the following:

a. A missile had exceeded the planned range of 50 km but not under control conditions. They had re-acquired the transponder signal after its loss in the pulse at maximum range. ANALYST NOTE: This indicates that the missile had been reacquired after the sixty (60) km range point.

b. A missile had hit an old aircraft.

2. In September 1953 Soviets went to the desert for missile firing tests. Source heard they fired missiles at old unpiloted aircraft. Results are unknown to him.

3. Source reports that [redacted] went to a desert testing area, and believes he was concerned with a rocket eventually used with the B-200 system. (No date acquired.)

B-200 OPERATOR PLAN

1. Source reports that each operator controlled five (5) channels. An azimuth/range and elevation/range scope was to be utilized with each five (5) channels of equipment. All targets appearing in the fifty-four (54) degree azimuth, and eight (8) to sixty-two (62) degree elevation sector were displayed and visible to the operator.

2. Displayed centrally on the indicators were the range/azimuth and range/elevation target tracking strobes respectively. All strobes for the five (5) channels were aligned directly over each other. Take for example a target coming in from sixty (60) kilometers. The operator evaluates the signal intensity as acquired from the azimuth and elevation systems respectively.

By means of a switch, he selects whether the range tracking circuit would utilize the signal derived from the azimuth or elevation measurement system. As the target moves to within automatic tracking range (said to be about 52 Km), the operator moves the angle/range strobe to the range and angle of the target. He presses a button on the joystick, and automatic track in the two coordinates begin. At this instant the tracking strobe becomes smaller dimensionally (gate size reduces), and the strobes for the other four (4) unused channels return automatically to the center of the indicator. Next he controls the strobe of the other angle, and places it on the target. It must be remembered that as the target was acquired first on the angle scope giving the best signal, the range gate was moving and in coincidence also with the signal on the other angle scope. Thus the second angle acquisition operation necessitated "control stick" movement in angle only since range was already on.

3. With automatic tracking of target accomplished in all three coordinates, a decision to fire the missile can now be made. Source said that first certainty of the target pursuing an incoming course must be ascertained. Missile engagements are not to be made on receding targets.

4. Tracking strobes are not visible on the scope for the missile. The angle and range tracking gates are precision set for a particular launching.

5. The azimuth angle gate covers ±3 degrees about the launcher azimuth, the elevation angle gate covers from eight (8) degrees to fourteen (14) degrees elevation angle, while the range gate is ±150 meters about the expected range acquisition point.

6. The missile is launched from the operator's position. The operation hereafter became completely automatic since when the missile reaches the eight (8) degree elevation beam automatic acquisition, and tracking in all three coordinates began.

A SOVIET-GERMAN DISCUSSED PLAN OF B-200 OPERATIONAL EMPLOYMENT

1. One plan discussed by both Germans and Soviets envisioned having the azimuth coverage sector of fifty-four degrees divided into four (4) angular quadrants. Each angular quadrant (one quarter of fifty-four degrees) would be allocated five (5) channels with operation by one (1) operator. Each five (5) channels would be concerned with launching areas placed on a constant azimuth line. Source indicated the closest launching area was envisioned as 1.7 Kms, and the farthest as 5.2 Kms. from the radar. There were to be three (3) additional launching areas at intermediate ranges between the two above.

2. Thus there would be five (5) launching areas on four (4) different azimuth lines. Individual azimuth lines would be separated by 13.5 degrees from adjacent ones. Each azimuth line would utilize five channels controlled by one operator. The whole would consist of twenty channels, four operators, and twenty launching areas.

3. Source reports that such a scheme would have limitations if as example the targets concentrated in one particular azimuth sector. He believed that this plan was considered inferior to one in which each operator controlling five (5) channels would view the whole fifty-four (54) degree azimuth sector, and be capable of engaging targets as allocated to him from a command selection central. He commented that the four individual azimuth line configuration of launching areas had another limitation since there would be cases where high missile lateral accelerations would be required to engage targets appearing into the other extremities of the azimuth sector.

4. Source reported that he suggested once that one (1) operator per channel be utilized. The Soviets commented that this would utilize too many personnel, and that one (1) operator per five channels was preferable.

THE SHM MISSILE

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Source has recalled that several [redacted] had done some work on an aircraft to aircraft missile development called SHM. His knowledge appears low; however, additional probing will be undertaken.

B-200 TARGET ACQUISITION TECHNIQUE

Source recalled that the optimum way for placing the strobes (angle-range gates) onto an incoming target was as follows: The strobes would be moved out beyond the target range and then moved "in range" across the target. This permitted a range gate rate approximating the target range rate to be accomplished. Such a condition was optimum for switching into automatic tracking. In cases where there was substantial differential between target and range gate rates, switching to automatic track became difficult.

TOPIC C — GMIC Intelligence Requirements

1. The requirements forwarded for REG-364 as attachment to EGQW-32533, dated April 26, 1957, did not carry a GMIC requirement number. We have numbered it GMIC Requirement No. 2.

2. The ORR requirement forwarded with dispatch EGQW-31892, dated 20 February 1957, was assigned GMIC Requirement No. 1.

3. It is requested that all GMIC requirements be numbered in the future starting with number three (3).

TOPIC D — General Information

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We have been fortunate to have the services of [redacted] ORR, for the last several weeks. He has given valuable support to the exploitation of REG-360 in regard to production and economic information. He also is in effect performing a training mission on these subjects for the [redacted] source 25X1C case officers. His visit has been both timely and of value.

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